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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/537,974

06/09/2005

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TS5567 US

7183

23632 7590 09/22/2008  
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EXAMINER

MCCAIG, BRIAN A

ART UNIT

PAPER NUMBER

1797

MAIL DATE

DELIVERY MODE

09/22/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/537,974	<b>Applicant(s)</b> MOUREAUX ET AL.	
	<b>Examiner</b> BRIAN MCCAIG	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 09 June 2005.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>See Continuation Sheet</u> .                                  | 6) <input type="checkbox"/> Other: _____                          |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :june 9, 2005, February 3, 2006, and May 29, 2007.

## **DETAILED ACTION**

### ***Summary***

1. This is the initial Office action based on the 10/537974 application filed June 9, 2005.
2. Claims 1-19 are pending and have been fully considered.

### ***Specification***

3. The disclosure is objected to because of the following informalities:
  - a. Page 6, paragraph 2: "For example, Sulphidation. . ." the word "sulphidation" should not be capitalized.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102/35 USC § 103***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made

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to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**6. Claims 1-3 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over BAKER, JR. ET AL (US 5951848).**

7. BAKER discloses a process to prepare a base oil having a viscosity index from at least 86 to 107 [see Table 2] starting with a feedstock that is either a distillate [column 4, lines 21-23] by contacting the feedstock in the presence of hydrogen with a sulfided hydrdesulfurization catalyst [column 7, lines 27-39] comprising nickel and tungsten on an acid amorphous silica-alumina carrier [column 4, line 60 to column 5, line 8 & column 5, line 62 to column 6, line 43] and performing a pour point reducing step (e.g., solvent or catalytic dewaxing) on the effluent to obtain the base oil [column 3, lines 34-50].

8. Regarding the rejection of claims 2-3 under 35 U.S.C 102(b), the applicant is reminded that when the prior art composition such as the hydrocracking catalyst of BAKER is the same as a composition described in the specification for carrying out the claimed method, it can be assumed the composition will inherently perform the claimed process of yielding a certain weight percentage of C<sub>4</sub>-hydrocarbon cracking products as required in claims 2 and 3 of the instant application under the conditions described therein. *In re King*, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986). For example, the amounts of metals present on the catalyst of BAKER range from 1 to 10 wt% Group VIII (e.g., nickel) and 10 to 30 wt% Group VI (e.g., tungsten) [column 6, lines 7-13]

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(compare to 2-10 wt% nickel and 5-30 wt% tungsten in the specification [page 3]); the catalysts are pre-sulfided [column 7, lines 28-39]; the surface areas [Table 2] are all greater than 100 m<sup>2</sup>/g as disclosed in the specification [page 5]; the pore volumes range from 0.33 to 0.45 ml/g, which overlaps the range in the specification [page 6]; and the pore diameters range from 50-400 angstroms, which also overlaps the range in the specification [page 6]. Therefore, although BAKER does not appear to explicitly disclose a sulfided hydrodesulfurization catalyst has a thiophene desulfurization activity greater than 30% as defined in the instant application under the conditions described therein, it is obvious that, since the catalyst of BAKER and the instant application are the same, under the same reaction conditions, the catalyst of BAKER would have the same level of catalyst activity as that required in the instant application.

### ***Claim Rejections - 35 USC § 103***

9. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over BAKER, JR. ET AL (US 5951848) as applied to claims 1-3 above and further in view of SHIMIZU ET AL in *Catalysis Today* (1998, vol 45, pgs 271-276), and SPEIGHT in *The Desulfurization of Heavy Oils and Residua* (1999, CRC Press, 480 pgs) [paragraphs 4-5, page 185 & paragraph 2, page 190] hereafter referred to as BAKER, SHIMIZU, and SPEIGHT, respectively.

10. BAKER does not appear to explicitly disclose the hydrodesulfurization catalyst wherein the Ni and W are impregnated on the carrier in the presence of a chelating agent. However, SHIMIZU discloses [see, e.g., the abstract & paragraphs 4, page 272]

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catalysts prepared with a chelating agent by impregnating  $\gamma$ - $\text{Al}_2\text{O}_3$  with an aqueous solution containing nickel nitrate and ammonium metatungstate and a chelating agent comprising one of ethylenediaminetetraacetic acid (EDTA) or trans-1,2-cyclohexanediamine-N,N,N',N'-tetraacetic acid (CyDTA). Additionally, it is obvious to one of ordinary skill in the art to recognize that a silica-alumina carrier or any constituent that possesses an acidic component such as a crystalline zeolite could be used in place of the alumina of SHIMIZU as evidenced by SPEIGHT in *The Desulfurization of Heavy Oils and Residua* (1999, CRC Press, 480 pgs) [paragraphs 4-5, page 185 & paragraph 2, page 190]. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the amorphous, sulfided Ni/W- $\text{Al}_2\text{O}_3$ /SiO<sub>2</sub> catalyst of SHIMIZU in view of SPEIGHT in the process of BAKER due to its greater hydrodesulfurization and hydrogenation activities as disclosed by SHIMIZU [see, e.g., the abstract].

Furthermore, as previously discussed, BAKER discloses a high activity catalyst, which is comprised of nickel and tungsten on a porous, amorphous metal oxide support such as silica-alumina, of which the catalyst of SHIMIZU as evidenced by SPEIGHT is an obvious variant. Therefore, the invention as a whole would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

**11. Claims 5-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over BAKER, JR. ET AL (US 5951848), SHIMIZU ET AL in *Catalysis Today*, and SPEIGHT in *The Desulfurization of Heavy Oils and Residua*, as applied to claims 1-4 above and further in view of TOBA ET AL in *Journal of Materials Chemistry***

**(1994, vol 4, no 7, pgs 1131-1135), hereafter referred to as BAKER, SHIMIZU, SPEIGHT, and TOBA, respectively.**

12. With respect to claim 5, modified BAKER does not appear to explicitly disclose that the alumina content of the hydrodesulfurization catalyst is between 10 and 60 wt%. However, the properties of amorphous alumina/silica supports depend on their preparation procedures as evidenced by TOBA [paragraph 1, page 1131 & Tables 1 and 2, page 1133]. For example, the surface area of the catalyst is dependent on both the preparation method (e.g., sol-gel, coprecipitation, or hydrogel kneading) as well as the ratio of alumina to silica. For example, for alumina concentrations ranging from 0 to 50%, which overlaps the range of the instant application, the surface area of silica/alumina support prepared by the sol-gel method has a minimum surface area of 573 m<sup>2</sup>/g [Table 2]. In most cases, surface area increases with decreasing alumina content regardless of the preparation method [see Table 2]. Therefore, it is obvious that in order for the catalyst of BAKER to have the surface area disclosed (e.g., 170 m<sup>2</sup>/g in Table 1), the alumina concentration is likely between 0 and 50% as evidenced by TOBA, which overlaps the range in the instant application.

13. With respect to claims 6 and 7, as previously discussed, BAKER discloses a catalyst that is equivalent to the one disclosed by the applicant. For example, the amounts of metals present on the catalyst of BAKER range from 1 to 10 wt% Group VIII (e.g., nickel) and 10 to 30 wt% Group VI (e.g., tungsten) [column 6, lines 7-13] (compare to 2-10 wt% nickel and 5-30 wt% tungsten in the specification [page 3]); the catalysts are pre-sulfided [column 7, lines 28-39]; the surface areas [Table 2] are all



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greater than 100 m<sup>2</sup>/g as disclosed in the specification [page 5]; the pore volumes range from 0.33 to 0.45 ml/g, which overlaps the range in the specification [page 6]; and the pore diameters range from 50-400 angstroms, which also overlaps the range in the specification [page 6]. The applicant is reminded that when the prior art device such as the hydrocracking catalyst of BAKER is the same as a composition described in the specification for carrying out the claimed method, it can be assumed the composition will inherently perform the claimed process of cracking n-heptane between 310° and 360° C, and, more specifically, 320 to 350° C as required in claims 6 and 7 of the instant application under the conditions described therein. *In re King*, 801 F.2d 1324, 231 USPQ 136 (Fed. Cir. 1986).

14. With respect to claims 8, the discussions of BAKER and modified BAKER in the preceding paragraphs are incorporated herein by reference. As previously discussed, the amounts of metals present on the catalyst of BAKER range from 1 to 10 wt% Group VIII (e.g., nickel) and 10 to 30 wt% Group VI (e.g., tungsten) [column 6, lines 7-13].

**15. Claims 9- 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over BAKER, JR. ET AL (US 5951848), SHIMIZU ET AL in *Catalysis Today*, SPEIGHT in *The Desulfurization of Heavy Oils and Residua*, and TOBA ET AL in *Journal of Materials Chemistry* as applied to claims 1-8 above and further in view of CHEN ET AL (US 6723297), hereafter referred to as BAKER, SHIMIZU, SPEIGHT, TOBA, and CHEN '297, respectively.**

16. With respect to claims 9 and 10, as previously discussed, the properties of amorphous alumina/silica supports depend on their preparation procedures as

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evidenced by TOBA [paragraph 1, page 1131 & Tables 1 and 2, page 1133]. For example, the surface area of the catalyst is dependent on both the preparation method (e.g., sol-gel, coprecipitation, or hydrogel kneading) as well as the ratio of alumina to silica. Similarly, CHEN '297 discloses [column 3, line 66-column 4, line 18; column 10, lines 19-56; & column 11, lines 33-36] a process for the preparation of amorphous alumina-silica using parallel flows and a fixed pH, in which the  $\text{SiO}_2$  content is 15-50 wt% (wherein the balance of  $\text{Al}_2\text{O}_3$  is 50-85 wt%, which overlaps the requirement in claim 5 of the instant application) which is impregnated with nickel and tungsten in concentrations of 1 to 20 wt% and 10 to 40 wt%, respectively. The surface area of the catalyst of CHEN '297 has a specific surface area of 180 to 300  $\text{m}^2/\text{g}$ , and more specifically, 200 to 250  $\text{m}^2/\text{g}$ , which overlaps the range required in claim 9 of the instant application. Furthermore, as previously discussed BAKER discloses pore volumes ranging from 0.33 to 0.45 ml/g. Similarly, CHEN '297 discloses pore volumes ranging from 0.25 to 0.45 ml/g. Consequently, the ranges of both references overlap the range required in claim 10 of the instant application. At the time of the invention, it would have been obvious to one of ordinary skill in the art to use the amorphous  $\text{Ni/W-Al}_2\text{O}_3/\text{SiO}_2$  catalyst of CHEN '297 in the process of BAKER due to its simplicity, controllability, and energy efficiency as disclosed by CHEN '297. Furthermore, as previously discussed, BAKER discloses a high activity catalyst, which is comprised of nickel and tungsten on a porous, amorphous metal oxide support such as silica-alumina, of which the catalyst of CHEN '297 is an obvious variant. Therefore, the invention as a whole would have

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been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made.

17. With respect to claim 11, BAKER discloses [column 6, lines 32-42] that no more than 5% of the pores have a diameter above 400 angstroms, which overlaps the range in the instant application.

18. With respect to claim 12, BAKER discloses that the concentration of sulfur in the feed may be greater than 700 ppm [see feeds K & L in Table 2].

**19. Claims 13-15 are rejected under 35 U.S.C. 103(a) as being unpatentable over BAKER, JR. ET AL (US 5951848), SHIMIZU ET AL in *Catalysis Today*, SPEIGHT in *The Desulfurization of Heavy Oils and Residua*, TOBA ET AL in *Journal of Materials Chemistry*, and CHEN ET AL (US 6723297) as applied to claims 1-12 above and further in view of DE BONT ET AL in *Hyperfine Interactions* (1998, vol 11, pgs 39-44), hereafter referred to as BAKER, SHIMIZU, SPEIGHT, TOBA, CHEN '297 and DE BONT, respectively.**

20. With respect to claim 13, the discussions of BAKER and modified BAKER in the preceding paragraphs are incorporated herein by reference. In addition, it is obvious to one of ordinary skill in the art to subject a feed to a hydrodesulfurization (HDS) process prior to hydrocracking the feed by contacting the feedstock in the presence of hydrogen with a sulfided dehydrodesulfurization catalyst as evidenced by DE BONT [see, e.g., paragraph 1, page 39], which discloses a first stage HDS step and a second stage hydrocracking step using a catalyst that combines hydrogenation (Group VI and VIII metal sites) and cracking (acidic, alumina/silica sites).

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21. With respect to claims 14 and 15, CHEN '297 discloses [see, e.g., column 7, lines 8-57 & column 8, lines 13-17] a molecular sieve (zeolite) ranging from 0 to 60 wt%, which subsumes the range in claim 14 of the instant application, wherein the zeolite includes zeolite-Y, zeolite □, and zeolite ZSM, as required in claim 15 of the instant application.

22. **Claims 16-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over BAKER, JR. ET AL (US 5951848), SHIMIZU ET AL in *Catalysis Today*, SPEIGHT in *The Desulfurization of Heavy Oils and Residua*, TOBA ET AL in *Journal of Materials Chemistry*, CHEN ET AL (US 6723297) and DE BONT ET AL in *Hyperfine Interactions* as applied to claims 1-15 above and further in view of SEQUEIRA in *Lubricant Base Oil and Wax Processing* (1994, Marcel Dekker, 288 pgs), hereafter referred to as BAKER, SHIMIZU, SPEIGHT, TOBA, CHEN '297, DE BONT, and SEQUEIRA, respectively.**

23. With respect to claims 16 and 17, the discussions of BAKER and modified BAKER in the preceding paragraphs are incorporated herein by reference. In addition, BAKER discloses [see, e.g., column 3, lines 43-50] a pour point reducing step comprised of catalytic dewaxing although solvent dewaxing is an equivalent process that is well known to one of ordinary skill in the art as evidenced by SEQUEIRA [paragraph 5, page 4] in which is disclosed that catalytic dewaxing is an alternative to solvent dewaxing.

24. With respect to claim 18, the discussions of BAKER and modified BAKER in the preceding paragraphs are incorporated herein by reference. In addition, BAKER

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discloses [column 9, lines 13-24 & 45-62] a platinum/ZSM-22 or platinum/ZSM-23 catalyst bound to silica as referenced by BAKER to PLANK ET AL (US 4076842) [column 9, line 26].

25. **Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over BAKER, JR. ET AL (US 5951848), SHIMIZU ET AL in *Catalysis Today*, SPEIGHT in *The Desulfurization of Heavy Oils and Residua*, TOBA ET AL in *Journal of Materials Chemistry*, CHEN ET AL (US 6723297), DE BONT ET AL in *Hyperfine Interactions*, and SEQUEIRA in *Lubricant Base Oil and Wax Processing* as applied to claims 1-18 above, and further in view of CHEN ET AL (US 4919788), hereafter referred to as BAKER, SHIMIZU, SPEIGHT, TOBA, CHEN '297, DE BONT, SEQUEIRA, and CHEN '788, respectively**

26. With respect to claim 19, the discussions of BAKER and modified BAKER in the preceding paragraphs are incorporated herein by reference. In addition, it is well known to one of ordinary skill in the art that a platinum/ZSM-12 can be used in a catalytic dewaxing process in place of a platinum/ZSM-22 or platinum/ZSM-23 catalyst as evidenced by CHEN '788 [column 20, lines 16-61].

### ***Conclusion***

27. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BRIAN MCCAIG whose telephone number is (571)270-5548. The examiner can normally be reached on M-F 8-430.

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28. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Glenn Caldarola can be reached on (571)272-1444. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

29. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BAM

/Glenn A Caldarola/  
Acting SPE of Art Unit 1797